

CLAIMS

1. A relay amplifier, installed at a branch point of a power line in a power line communication, for amplifying communication signals, said relay amplifier comprising:
a plurality of signal couplers which are provided at the power lines at both sides of the branch point, and which transmit communication signals to the power lines and receive the same therefrom; and
an amplifier that amplifies communication signals inputted from the plurality of signal couplers.
2. The relay amplifier according to claim 1, wherein the relay amplifier selectively amplifies a frequency band of a voltage waveform attenuating due to impedance of the branch points and the power lines.
3. The relay amplifier according to claim 1, wherein the plurality of signal couplers are connected to power lines having a different phase angle of the voltage waveform, among the power lines.
4. The relay amplifier according to claim 1, wherein the plurality of signal couplers are inductive type couplers each comprising a cylindrical ferrite core and a conductor wound around the outer circumferential surface of the ferrite core.
5. The relay amplifier according to claim 1, wherein the plurality of signal couplers are capacitance type couplers directly connected to the power lines, and are provided with a power source portion for generating a drive voltage of the amplifier upon receiving power from the power lines.
6. The relay amplifier according to claim 1, wherein at least one of the plurality of signal couplers is an inductive type or a capacitance type.
7. The relay amplifier according to claim 1, wherein the input and output terminals of the amplifier or the signal couplers are provided with a surge noise

protection circuit to stop input of surge noise resulting from inductive lightning.

8. The relay amplifier according to claim 1, further comprising: means for detecting an oscillation state of the amplifier; means for displaying the oscillation state of the amplifier; and means for adjusting gain of the amplifier.

9. The relay amplifier according to claim 1, further comprising: means for detecting an oscillation state of the amplifier; and means for stopping the oscillations by adjusting gain of the amplifier.

10. A power line communications system including any one of the amplifiers according to claims 1 through 9.

11. A power line communications method, in which a relay amplifier is provided at branch points of power lines in order to amplify communication signals, said method comprising the steps of:

transmitting and receiving communication signals with respect to the power lines via signal couplers each connected to the power lines at both sides of the branch point; and

amplifying the communication signals outputted from the signal couplers by using an amplifier.

12. An induction type signal coupler comprising:
a cylindrical ferrite core; and
a conductor wound around the outer circumferential surface of the ferrite core.